

What is Hepatitis B?

Hepatitis B is the most common serious liver infection in the world. It is caused by the Hepatitis B virus that attacks the liver. The virus is transmitted through blood and infected bodily fluids.

This can occur through direct blood-to-blood contact, unprotected sex, use of unsterile needles, and from an infected woman to her newborn during the delivery process.

The good news is that there is a simple blood test to find out if you have been infected. There is also a safe and effective vaccine to protect you and your loved ones against Hepatitis B. Finally, there are promising new treatments available for those who have developed chronic Hepatitis B infections.

The Hepatitis B virus is a small DNA virus that belongs to the Hepadnaviridae family of viruses.

The Hepatitis B virus causes Hepatitis B in humans. Related viruses in this family cause Hepatitis in ducks, ground squirrels and woodchucks.

The Hepatitis B virus contains an inner core and outer envelope. There is an outer shell (or envelope) composed of protein that is termed "surface antigen" or "HBsAg".

The surface antigen is generally produced in vast amounts, and the Hepatitis B blood tests can detect this portion of the virus in the blood of infected individuals.

The outer shell surrounds an inner protein shell that is referred to as the core particle or "HBcAg", which contains the viral DNA and enzymes used in viral replication (called "DNA polymerase").

Statistics

Most healthy adults (90%) who are infected will recover and develop protective antibodies against future Hepatitis B infections. A small number (5-10%) will be unable to get rid of the virus and will develop chronic infections. Unfortunately, this is not true for infants and young children – 90% of infants and up to 50% of young children infected with Hepatitis B will develop chronic infections. Therefore, vaccination is essential to protect infants and children. Hepatitis B is 100 times more infectious than the AIDS virus, yet it can be prevented with a safe and effective vaccine. For the 400 million people worldwide who are already chronically infected with Hepatitis B, the vaccine is of no use. The future, however, is much brighter with the current advances in drug development and treatment options.

Hepatitis B in the World

2 billion people have been infected (1 out of 3 people).

400 million people are chronically infected.

10-30 million will become infected each year.

An estimated 1 million people die each year from Hepatitis B and its complications.

Approximately 2 people die each minute from Hepatitis B.

Hepatitis B in the United States

12 million Americans have been infected (1 out of 20 people).

More than one million people are chronically infected.

Up to 100,000 new people will become infected each year.

5,000 people will die each year from Hepatitis B and its complications.

Approximately 1 health care worker dies each day from Hepatitis B.

Transmission

Hepatitis B is transmitted through blood and infected bodily fluids. This can occur through:

direct blood-to-blood contact

unprotected sex

unsterile needles

from an infected woman to her newborn during the delivery process.

Other possible routes of infection include sharing sharp instruments such as razors, toothbrushes or earrings. Body piercing, tattooing and acupuncture are also possible routes of infection unless sterile needles are used.

Hepatitis B is NOT transmitted casually. It cannot be spread through sneezing, coughing, hugging or eating food prepared by someone who is infected with Hepatitis B. Everyone is at some risk for a Hepatitis B infection, but some groups are at higher risk because of their occupation or life choices.

High Risk Groups

Health care workers and emergency personnel

Infants born to mothers who are infected at the time of delivery

Partners or individuals living in close household contact with an infected person

Individuals with multiple sex partners, past or present

Individuals who have been diagnosed with a sexually transmitted disease
Illicit drug users (injecting, inhaling, snorting, popping pills)
Men who have sex with men
Individuals who received a blood transfusion prior to 1992
Individuals who get tattoos or body piercing
Individuals who travel to countries where Hepatitis B is common (Asia, Africa, South America, the Pacific Islands, Eastern Europe, and the Middle East)
Individuals emigrating from countries where Hepatitis B is common or born to parents who emigrated from these countries (see above)
Families adopting children from countries where Hepatitis B is common (see above)
Individuals with early kidney disease or undergoing kidney dialysis
Individuals who use blood products for medical conditions (i.e. hemophilia)
Residents and staff of correctional facilities and group homes

Symptoms

Hepatitis B is called a "silent infection" because most people do not have noticeable symptoms when they are first infected. When a healthy adult is infected with the Hepatitis B virus, their body can respond in different ways. People who do not know they are infected can unknowingly pass the virus to others.

Hepatitis B causes no symptoms in about 69 percent of infected people.

Approximately 30 percent of infected individuals will have some symptoms. Many will think they just have the flu and ignore the symptoms.

About 1 percent of those infected will develop life-threatening "fulminant Hepatitis". These people may go into liver failure and require immediate medical attention. Although this response is rare, fulminant Hepatitis develops suddenly and can be fatal if left untreated.

Common symptoms of Hepatitis B infection include:

Fever, fatigue, muscle or joint pain

Loss of appetite

Mild nausea and vomiting

Serious symptoms that require immediate medical attention and maybe even hospitalization:

Severe nausea and vomiting

Yellow eyes and skin ("jaundice")

Bloated or swollen stomach

It is always a good idea to talk to your doctor if you don't feel well or if you are uncertain about whether you have been infected with Hepatitis B.

Acute vs. Chronic Hepatitis B

When a person is first infected with the Hepatitis B virus, this is called an "acute infection". A person may not have any symptoms or s/he could become seriously ill. Most adults will recover and get rid of the virus without any problems. If the virus remains in the blood for more than six months, then a person is diagnosed as having a "chronic infection".

Fortunately, most healthy adults (90%) who are infected with the Hepatitis B virus will recover and develop protective antibodies against future Hepatitis B infections.

Unfortunately, this is not true for infants and young children — 90% of infants and up to 50% of young children infected with Hepatitis B will not get rid of the virus and will develop a chronic infection. A smaller number of infected adults (5-10%) will also become chronically infected with Hepatitis B.

A [simple blood test](#) can diagnose a Hepatitis B infection. Repeated blood tests may be ordered over a six-month period to make an accurate diagnosis.

Your Liver & Its Functions

The liver is such an important organ that we can survive only one or two days if it shuts down - if the liver fails, your body will fail, too. Fortunately, the liver can function even when up to 75% of it is diseased or removed. This is because it has the amazing ability to create new liver tissue (i.e. it can regenerate itself) from healthy liver cells that still exist.

If your body were an automobile, your liver would be considered the engine. It does hundreds of vital things to make sure everything runs smoothly:

Stores vitamins, sugar and iron to help give your body energy.

Controls the production and removal of cholesterol.

Clears your blood of waste products, drugs and other poisonous substances.

Makes clotting factors to stop excessive bleeding after cuts or injuries.

Produces immune factors and removes bacteria from the bloodstream to combat infection.

Releases a substance called "bile" to help digest food and absorb important nutrients.

Vaccine Guidelines for Healthcare Professionals

The CDC recommends that all health care professionals, first responders, and others who are at risk for blood exposure on the job be vaccinated against Hepatitis B. Hepatitis B has been designated a disease for which immunization is strongly recommended.

Health care professionals are at the front-line in the battle against Hepatitis B. They are at risk for acquiring infection from an accidental blood exposure - they also pose a potential risk to patients if they are unknowingly infected themselves. Vaccination of all health care professionals is crucial in stopping the further spread of Hepatitis B.

Key Points

OSHA Federal Standard requires employers to offer Hepatitis B vaccine free of charge to employees who are occupationally exposed to blood or other potentially infectious materials. Vaccination should be completed during training in schools of medicine, dentistry, nursing, laboratory technology, and other allied health professions, before trainees have contact with blood.

Prevaccination serologic screening for previous infection is not indicated for persons being vaccinated because of occupational risk unless the hospital or health-care organization considers screening cost-effective.

Post-exposure prophylaxis with Hepatitis B immune globulin (HBIG) (passive immunization) and/or vaccine (active immunization) should be used when indicated (e.g., after percutaneous or mucous membrane exposure to blood known or suspected to be HBsAg-positive).

Persons who do not respond to the primary vaccine series should complete a second three-dose vaccine series or be evaluated to determine if they are HBsAg-positive.

Revaccinated persons should be retested at the completion of the second vaccine series. Persons who prove to be HBsAg-positive should be counseled accordingly

Booster doses are not considered necessary.

Periodic serologic testing to monitor antibody concentrations after completion of the three-dose series is not recommended.

Summary of ACIP Recommendations for HBV Immunization of Health Care Workers

Hepatitis B has been designated a disease for which immunization is strongly recommended.

Key Points from the ACIP Report

Any health professional who performs tasks involving contact with blood, blood-contaminated body fluids, other body fluids, or sharps should be vaccinated ([Table 2](#)).

Hepatitis B vaccine should always be administered by the intramuscular route in the deltoid muscle with a needle 1-1.5 inches long.

Among health-care professionals, risks for percutaneous and permucosal exposures to blood vary during the training and working career of each person but are often highest during the professional training period. Therefore, vaccination should be completed during training in schools of medicine, dentistry, nursing, laboratory technology, and other allied health professions, before trainees have contact with blood.

In addition, the OSHA Federal Standard requires employers to offer Hepatitis B vaccine free of charge to employees who are occupationally exposed to blood or other potentially infectious materials.

Prevaccination serologic screening for previous infection is not indicated for persons being vaccinated because of occupational risk unless the hospital or health-care organization considers screening cost-effective.

Post-exposure prophylaxis with Hepatitis B immune globulin (HBIG) (passive immunization) and/or vaccine (active immunization) should be used when indicated (e.g., after percutaneous or mucous membrane exposure to blood known or suspected to be HBsAg-positive ([Table 3](#)).

Needlestick or other percutaneous exposures of unvaccinated persons should lead to initiation of the Hepatitis B vaccine series.

Post-exposure prophylaxis should be considered for any percutaneous, ocular, or mucous membrane exposure to blood in the workplace and is determined by the HBsAg status of the source and the vaccination and vaccine-response status of the exposed person ([Table 3](#)).

If the source of exposure is HBsAg-positive and the exposed person is unvaccinated, HBIG also should be administered as soon as possible after exposure (preferably within 24 hours) and the vaccine series started. The effectiveness of HBIG when administered greater than 7 days after percutaneous or permucosal exposures is unknown.

If the exposed person had an adequate antibody response (greater than or equal to 10 mIU/mL) documented after vaccination, no testing or treatment is needed, although administration of a booster dose of vaccine can be considered.

Post-vaccination testing for antibody to Hepatitis B surface antigen (HBsAb or anti-HBs) response is indicated for HCWs who have blood or patient contact and are at ongoing risk for injuries with sharp instruments or needlesticks (one to 2 months after completion of the 3-dose vaccination series).

Persons who do not respond to the primary vaccine series should complete a second three-dose vaccine series or be evaluated to determine if they are HBsAg-positive.

Revaccinated persons should be retested at the completion of the second vaccine series. Persons who prove to be HBsAg-positive should be counseled accordingly.

Primary non-responders to vaccination who are HBsAg-negative should be considered susceptible to HBV infection and should be counseled regarding precautions to prevent HBV infection and the need to obtain HBIG prophylaxis for any known or probable parenteral exposure to HBsAg-positive blood ([Table 3](#)).

Booster doses are not considered necessary. Vaccine-induced antibodies to HBV decline gradually over time, and less than or equal to 60% of persons who initially respond to vaccination will lose detectable antibodies over 12 years. *Studies among adults have demonstrated that, despite declining serum levels of antibody, vaccine-induced immunity continues to prevent clinical disease or detectable viremic HBV infection.* The possible need for booster doses will be assessed as additional data become available.

Periodic serologic testing to monitor antibody concentrations after completion of the three-dose series is not recommended. Asymptomatic HBV infections have been detected in vaccinated persons by means of serologic testing for antibody to Hepatitis B core antigen (anti-HBc) (1). However, these infections also provide lasting immunity and are not associated with HBV-related chronic liver disease.

Prevention Measures

Hepatitis B is a vaccine-preventable disease. There is a safe and effective vaccine to protect infants, children and adults from Hepatitis B. Billions of doses have been given worldwide. [Learn more.](#)

All sex partners, family and close household members of a chronically infected person should be screened and vaccinated. Reassure patients and families that Hepatitis B is not casually transmitted - it is spread through blood, not by coughing, sneezing, hugging or sharing food.

Additional Prevention Measures

In addition to vaccination, there are other simple ways to help stop the spread of Hepatitis B:

Wash your hands thoroughly after any potential exposure

Practice safe sex with all partners

Avoid direct contact with blood and bodily fluids

Clean up blood spills with a fresh diluted bleach solution

Cover all cuts carefully

Avoid sharing sharp items such as razors, nail clippers, toothbrushes, and earrings or body rings

Discard sanitary napkins and tampons into plastic bags

Avoid illegal street drugs (injecting, inhaling, snorting, popping pills)

Do not donate blood or body organs

Make sure new, sterile needles are used for ear or body piercing, tattoos, and acupuncture

Hepatitis B Vaccine

It takes only 3 shots to protect yourself and your loved ones against Hepatitis B for a lifetime.

In 1981, the Food and Drug Administration approved the first vaccine for Hepatitis B, which was plasma-derived (i.e. made from blood products). This vaccine was discontinued in 1990 and is no longer available in the U.S.

The currently used Hepatitis B vaccines are made synthetically (i.e. they do not contain blood products) and have been available in the U.S. since 1986. You cannot get Hepatitis B from the vaccine. [Learn more.](#)

This safe and effective vaccine is recommended for all infants at birth and for children up to 18 years. Adults, especially those who fall into a high-risk group, should also seriously consider getting the Hepatitis B vaccine.

Vaccine Side Effects and Safety

Common side effects include soreness, swelling and redness at the injection site. The vaccine may not be recommended for those with documented yeast allergies or a history of an adverse reaction to the vaccine.

The Hepatitis B vaccine is considered one of the safest and most effective vaccines ever made. Numerous studies looking at the vaccine's safety have been conducted by the Centers for Disease Control, World Health Organization, and other professional medical associations. They have not found any evidence that the vaccine causes sudden infant deaths (SIDs), multiple sclerosis, or other neurological disorders.

Vaccine Recommendations

The Hepatitis B vaccine is recommended specifically for all infants and children by the Centers for Disease Control and the American Academy of Pediatrics. The CDC also recommends that adults in high-risk groups be vaccinated.

The following list is a general guide for vaccination, but since every person is at some risk for infection, these guidelines should be individualized for each situation.

All infants at birth and all children up to 18 years.

Health care professionals and emergency personnel.

Sexually active teens and adults

Men who have sex with men.

Sex partners or close family/household members living with an infected person.

Families considering adoption, either domestic or international.

Travelers to countries where Hepatitis B is common (Asia, Africa, South America, the Pacific Islands, Eastern Europe, and the Middle East).

Patients with kidney disease or undergoing dialysis.

Residents and staff of correctional facilities and group homes.

Any person who may fall into a high risk group due to occupation or lifestyle choices.

Vaccine Schedule

The vaccine is readily available at your doctor's office or local health clinic. Three doses are generally required to complete the Hepatitis B vaccine series, although there is an accelerated two-dose series for adolescents.

First Injection - At any given time

Second Injection - At least one month after the first dose

Third Injection - Six months after the first dose